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DIRECTORATE OF
INTELLIGENCE

Industrial Facilities
(Non-Military)

Basic Imagery Interpretation Report

Yaroslavl Petroleum Refinery

Yaroslavl, USSR

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DATE JUNE 1969

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
Imagery Analysis Service

INSTALLATION OR ACTIVITY NAME			COUNTRY
Yaroslavl Petroleum Refinery			UR
UTM COORDINATES	GEOGRAPHIC COORDINATES		WAC-PIC NO
37VED478790	57-32-58N 039-47-47E		0154-70-T

MAP REFERENCE
8th RTS. USATC 200, Sheet M0154-19HL, 3rd edition, May 66, Scale 1:200,000
(SECRET

LATEST IMAGERY USED	NEGATION DATE (If required)
	Not Required

ABSTRACT

This report provides a detailed imagery-derived analysis of the Yaroslavl Petroleum Refinery in the USSR. The refinery, although in an early stage of construction, was observed in operation in April 1962, the first photography utilized for this study. Construction of the facilities continued until May 1969 when only minor additions to the plant remained incomplete. It was observed in operation on all photography utilized.

This report includes a detailed line drawing and a photograph of the refinery, mensuration of storage tanks, a chronology of the plant construction and production activity, and reference data.

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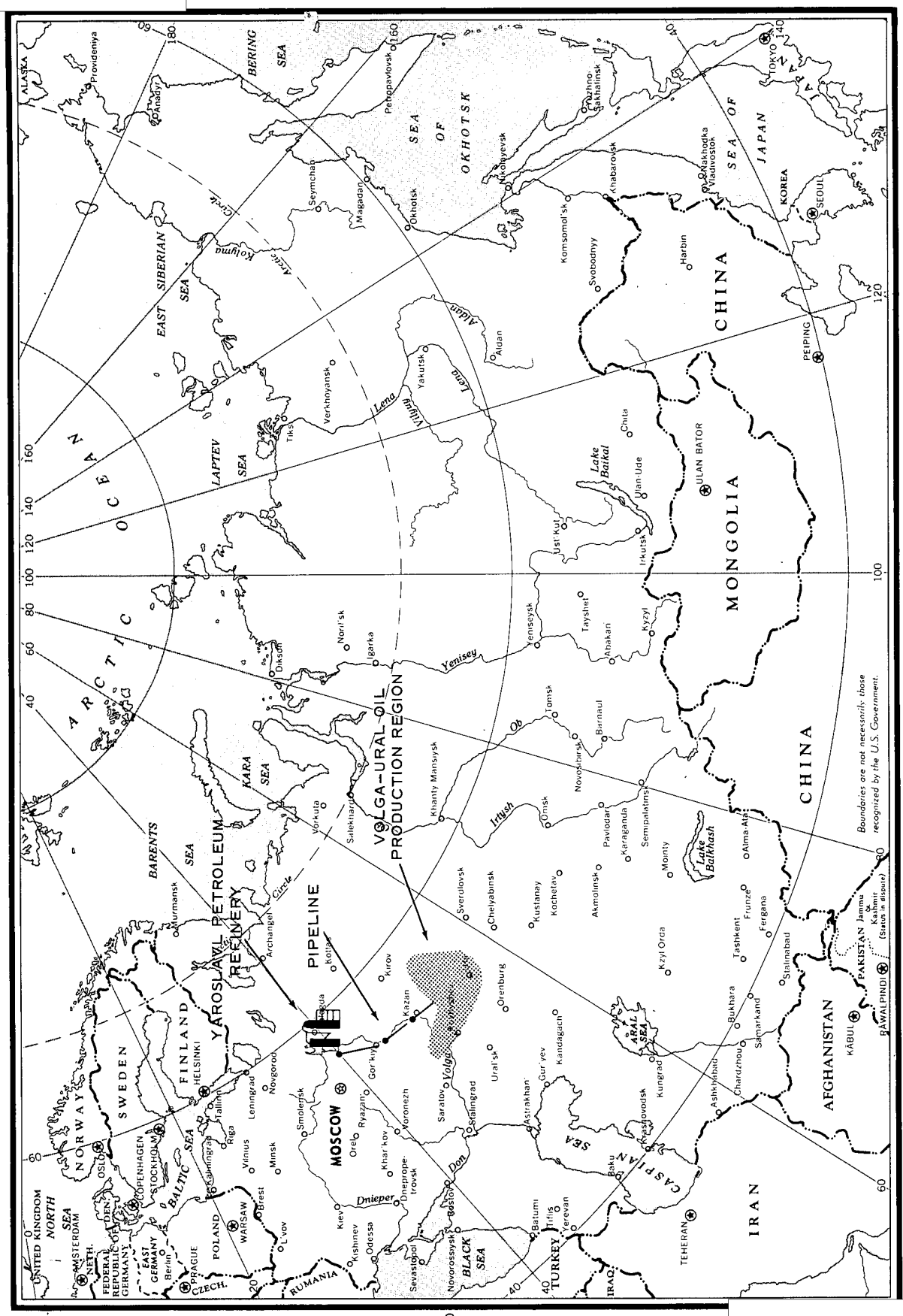

FIGURE 1. LOCATION MAP

TOP SECRET RUFF

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INTRODUCTION

The Yaroslavl Petroleum Refinery is located approximately 6 nautical miles southwest of Yaroslavl.

The Volga-Ural Region, Tatar, ASSR supplies the crude oil to the refinery. Some of the crude is brought in by a large diameter pipeline and some by railroad tank car. 1/2/

The Yaroslavl Heat and Thermal Power Plant TETS 3 is located adjacent to the refinery and furnishes electric power and steam to the refinery components. Also located nearby are a water treatment plant and an unidentified chemical plant. 25X1

BASIC DESCRIPTION

Physical Features

The refinery occupies a rectangular-shaped area which measures approximately 8,870 by 4,200 feet and contains approximately 850 acres. In addition there are about 220 acres in the transfer and storage area (Area P) which is offset from the basic refinery units. The refinery is served by a good all-weather road system and by a spur from the main rail line between Moscow and Danilov.

Operational Functions

Based on the identification of the equipment now complete and in operation, the major products of the refinery probably include straight-run and blended gasoline of a wide octane range, kerosene, diesel and fuel oils, and gaseous hydrocarbons. Also possibly produced are a full range of lubricating oils, waxes, and asphaltic materials.

Construction Status and Activity

April 1962 -- Four crude oil distillation units were complete and 96 tanks had been built in the crude oil and products storage area. Although major components of the refinery were still under construction it appeared to be in operation as evidenced by a plume from the flare tower and by the operation of the power plant.

July 1963 -- Construction of the refinery was proceeding at a moderate rate.

August 1965 -- The remaining crude distillation units, one unidentified processing unit in Area F, and the unidentified processing units in Area L appeared complete. The catalytic cracking unit was in the late stages of construction. The plant appeared to be in operation.

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December 1966 -- A second unidentified processing unit in Area F and a probable thermal reforming/cracking unit were in the early stages of construction, and the possible lubricating oil plant was in the mid-stage of construction. The refinery was observed in operation.

March 1969 -- An unidentified processing unit (Area J) was in the mid-stage of construction and minor expansion was taking place in the engineering support area. The refinery otherwise appeared to be complete and all units were in operation.

Facilities and Equipment

The following table lists the functional areas and equipment within the refinery. All items are keyed to Figure 3.

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Facilities and Equipment at Yaroslavl
Petroleum Refinery

Area	Functional Description	Equipment*
A	Crude Oil and Products Storage	115 Cylindrical tanks 5-60 ft. diam. 17-50 ft. diam. 28-40 ft. diam. 55-30 ft. diam. 8-20 ft. diam. 2-10 ft. diam. 29 Horizontal tanks 20-25 ft. long by 10 ft. diam. 9-30 ft. long by 15 ft. diam. 1 Loading rack (not shown) 4 Pumping buildings 5 Miscellaneous buildings
B	Crude Oil Distillation	5 Crude oil distillation units 1 Multistage distillation unit with 1 Atmospheric column 1 Vacuum column 3 Pre-fractionation/redistillation columns 3 Pipe furnaces 3 Banks of heat exchangers cooling coils/accumulators 1 Compressor/control building 1 Building with 4 De-salting drums 2 Miscellaneous buildings 2 Cylindrical tanks, 10 ft. diam. 2 Multistage distillation units each with 1 Atmospheric column 1 Vacuum column 3 Pre-fractionation/redistillation columns 2 Pipe furnaces 2 Banks of heat exchangers/ cooling coils/accumulators 1 Compressor/control building 1 Building with 7 de-salting drums 2 Cylindrical tanks, 10 ft. diam.

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Area	Functional Description	Equipment*
B	Crude Oil Distillation - Continued	2 Multistage distillation units each with 1 Atmospheric column 1 Vacuum column 2 Pre-fractionation/redistillation columns 2 Pipe furnaces 2 Banks of heat exchangers/ cooling coils/accumulators 1 Compressor/control building 2 Possible oil-gas separation units each with 5 Possible oil-gas separators 1 Compressor/control building 4 Cylindrical tanks 20 ft. diam. 10 Horizontal tanks (at one unit) and 7 horizontal tanks and 1 miscellaneous building (at the other unit)
C	Possible Catalytic Cracking	1 Possible fractionating column 1 Possible reactor/regenerator 1 Pipe furnace 1 Bank heat exchangers/cooling coils/ accumulators 1 Compressor building 1 Control building 6 Miscellaneous buildings 4 Cylindrical tanks 3-50 ft. diam. 1-30 ft. diam.
D	Possible Polymerization	1 Possible Polymerization unit with 1 Steam generator 1 Possible gas purification building 2 Banks heat exchangers 1 Reactor section with 6 Reactors 1 Fractionation section with 4 Fractionators 1 Compressor building 2 Compressor/control buildings 1 U/I building 3 Horizontal tanks 25X1 1 Distillation unit with 1 Atmospheric column 1 Stripping column 1 Pipe furnace 1 Bank heat exchangers 1 Compressor building

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Area	Functional Description	Equipment*
D	Possible Polymerization - Continued	9 Cylindrical tanks 40 ft. diam. 1 Miscellaneous building
E	Unidentified Processing	1 Unidentified Processing unit with 6 Columns/reactors 1 Compressor/control building 1 Cylindrical tank 40 ft. diam. 2 Small cylindrical tanks (not measured)
F	Unidentified Processing	2 Processing units 1 Unit with 6 Fractionating/reactor columns 1 Bank heat exchangers 1 Steam generator 2 Pipe furnaces 1 Compressor building 2 Control buildings 1 Miscellaneous building 1 Unit with 6 Fractionating/reactor columns 1 Piece U/I process equipment 1 Bank heat exchangers 1 Steam generator 2 Compressor buildings 2 Control buildings 3 Miscellaneous buildings
G	Products Storage	12 Cylindrical tanks 10-40 ft. diam. 2-20 ft. diam. 1 Miscellaneous building
H	Unidentified Processing	1 Unit with 4 Fractionators/reactors 2 Processing buildings 4 Cylindrical tanks 30 ft. diam.
I	Unidentified Processing	3 Fractionation/reactor columns 2 Banks heat exchangers 4 Pipe furnaces 1 Compressor building 1 Control building 3 Miscellaneous buildings

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Area	Functional Description	Equipment*
J	Unidentified Processing Area Under Construction	5 Possible columns/reactors U/C 1 T-shaped possible processing unit U/C 2 Buildings U/C 4 Tanks U/C
K	Possible Alkylation	9 Columns/reactors 1 Bank U/I processing equipment 5 Horizontal reactors 1 Processing building 1 Bank heat exchangers/cooling coils/accumulators 1 Compressor building 1 U/I building 10 Horizontal tanks (not measured)
L	Unidentified Processing	4 Processing units 1 Unit with 4 Fractionating/reactor columns 2 Banks of heat exchangers/cooling coils 1 Possible compressor building 1 Unit with 4 Fractionating/reactor columns 1 Bank of heat exchangers/cooling coils/accumulators 2 Units each with 3 Fractionating/reactor columns 1 Bank of heat exchangers/cooling coils/accumulators Serving the latter three units are 1 Bank of U/I processing equipment 1 Compressor building 1 Bank of heat exchangers/cooling coils/accumulators 23 Horizontal tanks (not measured) 2 Pumping buildings 3 Miscellaneous buildings
M	Engineering and Support	4 Engineering support buildings 31 Miscellaneous buildings 7 Structures U/C 22 Induced-draft cooling towers 16 Filter/treatment basins 8 Cylindrical tanks 40 ft. diam. 6 Horizontal tanks (not measured) 2 Cylindrical tanks U/C 1 Flare tower

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Area	Functional Description	Equipment*
N	Probable Thermal Reforming/ Cracking	13 Fractionating/redistillation columns 4 Pipe furnaces 3 Banks heat exchangers/cooling coils/accumulators 2 Compressor buildings 3 Compressor/control buildings 6 Cylindrical tanks 40 ft. diam. 2 Horizontal tanks
O	Possible Lubricating Oil Plant	2 Processing buildings 2 Pumping buildings 7 Associated buildings 29 Cylindrical tanks 20 ft. diam. 3 Horizontal tanks
P	Transfer and Storage Facilities	5 Rail served loading racks (not shown on graphic) 39 Cylindrical tanks 13-110 ft. diam. 26- 75 ft. diam. 28 Semiburied reservoirs 22 Support buildings

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*All storage tank dimensions are approximate.

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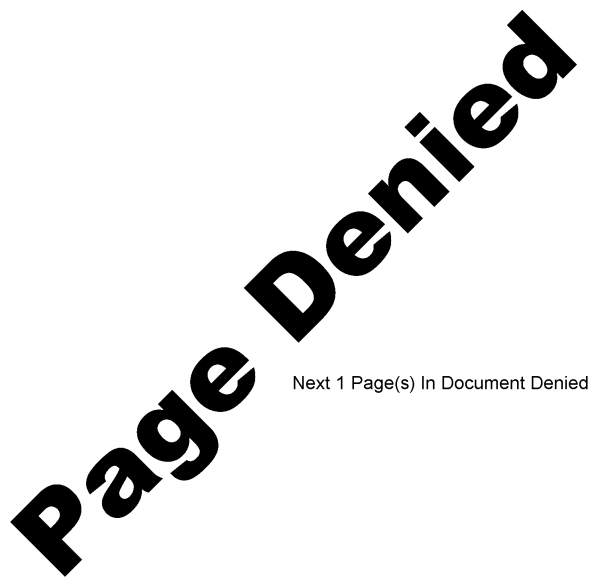

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Maps and Charts

8th RTS. US Air Target Chart 200, Sheet M0154-19HL, 3rd edition, May 66, Scale 1:200,000 (SECRET

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Documents

1. Ebel, Robert E. The Petroleum Industry of the Soviet Union, American Petroleum Institute, 1961 (UNCLASSIFIED)

2. International Petroleum Encyclopedia, The Petroleum Publishing Co., 1969 (UNCLASSIFIED)

Requirement

EXSUBCOM - BR-N/001-69

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